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ENTOMOLOGICAL NEWS

VOL. LIII JULY, 1942 No 7

Clouds of Butterflies in Mexico: A Study in Butterfly Aggregations (Lepid.: Rhopalocera).

By PHIL RAU, Kirkwood, Missouri.

(Continued from page 155.)

SUMMARY AND DISCUSSION.

The clouds of butterflies along the highways of Mexico were charming to behold, but it was soon discovered that the insects so conspicuously afloat in the air, attained that position for the most part at the behest of artificial disturbances. Normally the butterflies spend the daylight hours at rest in moist places on the ground or in cool culverts under the highway in small or large aggregations of one or more species.

Observing the various species so congregated, one soon notices behavior-patterns among them of great diversity. Their conduct under these conditions, it seems to me, has much to teach us from several avenues of approach, the most important being that of societal evolution. Butterflies, because of their "desire" to be in close company of one another, present links in the chain of evolution of insect-societies which, as is well known, have had their culmination in the complex social conditions of the higher Hymenoptera.

Butterflies as already stated, spend long hours among their fellows in cool culverts or on the moist ground in the tropical sunshine. The coolness, the moisture, and the sunshine evidently are the factors which hold them to the places in which they congregate, while the yen for sociability is what brings them together in the first place. It is quite likely in all of this, that an awareness of color or of color-pattern as well as of odor and tactile perception are the influencing factors; there may also be a recognition of species or of family (taxonomic) by these or by other means.

Many of the reactions, since they come about by the use of

the sense organs, are open for experimentation and study, and with proper technique may be weighed and measured. That which is not measurable, however, and also is quite unaccountable, is the peculiar craving for sociability, which appears not alone in butterflies, but more or less strongly in all organisms. Wheeler[4] has discussed the subject solely from the standpoint of insects, and Allee[5] has done so for organisms from Protozoa to Man. Various points of view are expressed by them to account for the presence of social and sub-social conditions, and also its evolution. but both have neglected to mention this kind of gregariousness among butterflies. The last word has not yet been said on the problems involved, nor on the various steps taken by organisms in the evolution of insect societies.

Since butterflies have been overlooked in studies of societal evolution, an attempt is here made to classify the behavior data given in the forepart of this paper. This behavior runs the gamut from the decidedly non-social conditions as observed, for example, in the reddish-brown *Anaea aidea* to the highly gregarious conduct of, say, the large yellow *Phoebis agarithe maxima* where as many as several thousand individuals congregate solidly or congregate in company with the large white *Anteos clorinde*. Between these extremes may be found examples of several kinds and degrees of gregariousness; in fact, the twenty-six species observed in this study may be classified into six categories. The categories and the butterflies which belong to each of them follow:

1. Those which are non-social, showing no tendency to gregariousness; *Anaea aidea, Chioides zilpa.*

2. Those which are non-social, but only occasionally are found to be gregarious; and then only in groups of their own species; *Papilio philolaus, Victorina stelenes biplagiata.*

3. Those which are non-social, but occasionally are found in groups, not of their own species but in groups of other species;

[4] The Social Insects, 1928.
[5] Animal Aggregations, 1931.

none.

4. Those which are found in aggregations solidly of their own species: *Phoebis agarithe maxima, Chiomara asychus, Eurema neda, Achlyades thraso, Colaenis julia, Precis lavinia zonalis, Athena chiron, Athena petreus.*

5. Those which are found in aggregations of different species but all of, more or less, the same color as themselves: *Eurema gratiosa, E. mexicana, E. neda nelphe, Papilio cresphontes, Papilio thoas autocles, Chlosyne janais, Microtia elva.*

6. Those found in aggregations of mixed species and also of different colors: *Phoebis agarithe maxima, Anteos clorinde, Phyciodes vesta boucardi, Anthanassa texana, Chlosyne lacinia, C. adjutrix, C. janais, Ascia monuste monuste.*

It is apparent from the classification that it is possible for some species to be placed in more than one category, as in the case of *Phoebis agarithe maxima,* and also that one category is possible (no. 3) for which no species have yet been found.

It is further apparent, that the gregarious behavior of the butterflies is by no means haphazard, and that the various types may easily be classified; although one may also readily perceive that at other times and in other places a species by its changed behavior may entirely upset its present status of classification. This study, therefore, is suggestive rather than exhaustive. It brings one to the realization of the need for much additional observation and experiment before a phylogenetic scheme may be built up for the evolution of social behavior in insects.

There are two additional aspects of butterfly behavior more or less remote from that of aggregation, which may, however, have an indirect bearing on the subject. One is the proportion of sexes in aggregations and the other has to do with how or where the butterflies spend the night. While I neglected to make first hand observations on where the insects spend the night, I did note in the material brought home for identification that almost all of the butterflies were males. These questions, however, have been answered by Wallace and by Belt, both of whom observed butterfly aggregations in the tropics. Wallace (Tropical Nature, p. 76, 1878) found butterflies "assem-

bling together in flocks of hundreds of individuals, on riversides and margins of pools, but these were almost always composed of males, the females remaining in the forests where toward the afternoon their partners join them." Bates (Naturalist on the Amazon, p. 386, 1863) observed 80 species belonging to 22 different genera congregating on the sand and says "it is a singular fact that, with very few exceptions, the individuals of these various species, sporting in sunny places were of the male sex; their partners, which are much more soberly dressed, and immensely less numerous than the males being confined to the shades of the woods. Every afternoon as the sun was getting low I used to notice these gaudy sunshine loving swains trooping off to the forest."

Notes on a Collection of Centipeds chiefly from Louisiana, Arkansas and Missouri (Chilopoda).

By RALPH V. CHAMBERLIN, University of Utah,
Salt Lake City.

Herewith are listed the species of chilopods represented in a collection made for the most part by Mr. Leslie Hubricht in Louisiana, Arkansas, Missouri, Oklahoma and Texas in the years 1935 and 1936.

The types of the four new species described are retained in the author's collection.

SCOLOPENDRIDA.

OTOCRYPTOPS SEXSPINOSUS (Say). Localities—Louisiana: Sheridom, August 20, 1940, one specimen; Natchitoches Parish, 2 miles south of Saline, April 12, 1936, 2 specimens. Arkansas: Jackson County, 1.5 miles southwest of Oliphant, April 10, 1936, one specimen. Missouri: St. Louis Co., 4.3 miles northwest of Glencoe, March 1, 1936, one specimen.

THEATOPS POSTICUS (Say). Localities—Louisiana: Tali-

sheek, February 9, 1939, 2 specimens; Greenburg, February 5, 1939, one specimen. Texas: Brazos County, 8 miles south of College Station, April 21, 1936, 3 specimens.

T. SPINICAUDUS (Wood). Locality—Arkansas: Jackson County, 1.5 miles northwest of Oliphant.

SCOLOPENDRA VIRIDIS Say. Locality—Louisiana: Caddo Parish, 5 miles northwest of Shreveport, April 13, 1936, one specimen.

S. HEROS (Girard). Locality—Texas: Brazos County, 14 miles southwest of College Station, April 21, 1936, one specimen.

GEOPHILIDA.

ARENOPHILUS BIPUNCTICEPS (Wood). Localities—Oklahoma: Murray County, Arbuckle Mountains, near Turner Falls, April 23, 1936, two specimens. Louisiana: Caddo Parish, 5 miles northwest of Shreveport, April 13, 1936, two specimens. Missouri: St. Louis County, 1 mile south of Kirkwood, March 15, 1936, one specimen; Musick's Ferry, May 15, 1934, one specimen.

LINOTAENIA BIDENS (Wood). Locality—Missouri: Jefferson County, 1.5 miles southeast of Maxville, December 8, 1935, one specimen taken "under log on hillside."

L. CHIONOPHILA (Wood). Locality—Missouri: St. Louis County, 4.3 miles northwest of Glencoe Station, March 1, 1936, one specimen.

L. FULVA (Sager). Locality—Missouri: St. Louis County, .5 miles east of Morschels, March 15, 1936, one specimen.

Escaryus missouriensis new species.

General color of dorsum dark yellow anteriorly and especially the head of a distinct chestnut tinge.

Head longer than broad in about the ratio 36:29. No front suture. Cephalic plate overlapping the basal. First maxillae without lappets.

Clypeus uniformly areolate throughout. No clear spots free from the polygonal areas; a pair of setae about one-fourth the distance from labrum to anterior end and about eight setae in a patch anteriorly.

Prosternum anteriorly with a median v-shaped excision on each side of which is a low, transverse, chitinous plate; without chitinous lines. Femur of prehensors with a tooth at extreme

distal end within; the next 2 joints also with low rounded tubercles at distal end; tooth at base of claw absent or absolete.

Spiracles all circular, the first greatly exceeding the second in size.

Anterior sternites with a deep longitudinal depression or sulcus across the middle portion; all entirely without a "carpophagus" structure.

Last sternite narrow, scarsely narrowing caudad, much longer than wide. Last coxopleurae large, bearing numerous small pores over nearly entire surface except cuadal area above and caudomesal area below.

Anal legs of male moderately inflated; Claw normal.

Anal pores distinct.

Gonopods of male long, slenderly conical.

Pairs of legs, 59.

Length, about 65 mm.

Locality—MISSOURI: St. Louis County, 4.3 miles northwest of Glencoe. One male taken by Leslie Hubricht, March 11, 1936.

LITHOBIIDA.

Gosibius louisianus new species.

A species belonging to *Gosibius* sens. str. in having the posterior angles of the 9th, 11th and 13th dorsal plates produced.

Dorsum chestnut colored.

Antennae moderate, composed of 26 articles in both types. Ocelli, e.g., 1 + 3, 3, 3, 1, the single ocellus much enlarged and the caudal ocellus of top row also considerably enlarged.

Prosternal teeth as usual, 2 + 2, with extal spine setiform.

Ventral spines of first legs 0, 0, 2, 2, 1. Ventral spines of penult legs, 0, 1, 3, 3, 2; dorsal 0, 3, 2, 2; claws 2. None of coxae armed either dorsally or laterally.

In the male the fourth joint is moderately thickened and is longitudinally furrowed above.

Claw of female genital forceps strictly entire as usual; basal spines 2 + 2; basal joint presenting a chitinous mesal edge which is proximally excavated.

Length of male holotype, about 19 mm.; of female allotype, about 15 mm.

Locality—LOUISIANA: 5 miles northwest of Shreveport. Male and female taken under log April 13, 1936, by Leslie Hubricht.

Related to *G. monicus* of California but readily separated in lacking spines on the posterior coxae and in having the ventral

spines of the anal legs 0, 1, 3, 2, 1 instead of 0, 1, 3, 3, 1.

Guambius hubrichti new species.

Dorsum light brown, with head and antennae darker.

Antennae composed typically of 28 articles. Ocelli, *e.g.*, 1 + 3, 2(3), 1, the single ocellus much enlarged and those at caudal end of series also notably larger than the anterior ones.

Prosternal teeth and spines as usual.

Posterior angles of 9th, 11th and 13th dorsal plates produced (subgenus *Sibibius*).

Coxal pores small, circular, in number, e.g., 4, 4, 4, 3 and 3, 3, 3, 3.

Ventral spines of first legs, 0, 0, 1, 3, 1. Ventral spines of penult legs, 0, 1, 3, 3, 2; dorsal, 0, 0, 3, 2, 1; claws 2. Ventral spines of anal legs, 0, 1, 3, 3, 1; dorsal, 0, 0, 2, 0, 0; claws 2. None of coxae armed.

Anal legs of male with fourth joint strongly inflated, with longitudinal, laterally compressed, elevated keel which is evenly convex from end to end with a uniform series of setae along the edge. Fifth joint of penult leg with a conspicuous lobe at distal end on caudo-dorsal surface the upper face of this lobe flat.

Claw of female gonopods entire as usual, with the basal spines 2 + 2.

Length, about 12 mm.

Locality—LOUISIANA: Natchatoches Parish, 2 miles south of Saline. Two adult males and a not fully mature female taken under logs April 12, 1936, by Leslie Hubricht, for whom the species is named.

Related to *G. oedipes* but differing in having 2 claws instead of 3 on the anal legs with dorsal spines 0, 0, 2, 0, 0 instead of 0, 0, 3, 2, 1, etc. The form of the fourth joint in the anal legs of male is also clearly distinctive.

LITHOBIUS FORFICATUS (Linne). Locality—Missouri: St. Louis County, Maplewood, January 12, 1936, several specimens of both sexes.

NADABIUS IOWENSIS (Meinert). Localities—Missouri: Kirkwood, Osage Hills, January 10, 1935, three specimens; St. Louis County, Creve Coeur Lake Park, March 8, 1936, one male.

POKABIUS BILABIATUS (Wood). Locality—Missouri: St. Louis County, .5 miles east of Morschels, March 15, 1936, sev-

eral specimens.

NEOLITHOBIUS AUDACIOR Chamberlin. Locality—ARKANSAS: Jackson County, 1.5 miles southwest of Oliphant, April 10, 1936, four specimens.

N. TRANSMARINUS (L. Koch). Localities—Louisiana: Caddo Parish, 5 miles northwest of Shreveport, April 13, 1936, two specimens. Texas: Brazos County, 8 miles south of College Station, April 21, 1936, three specimens.

Neolithobius entonus new species.

A species related to *N. latzeli* and *N. arkansensis* in general structure and in the spining of the legs but differing from both in having the claw of the female gonopods strictly entire instead of tripartite as well as in its considerably larger size.

Antennae moderately long, composed typically of about 42 articles. Ocelli 1 + 6, 6, 7, 6, 6, 6, the series somewhat oblique, the single ocellus large.

Prosternal teeth typically 9 + 9 or 8 + 8.

Coxal pores strongly transverse, lying in depression or groove; in number usually about 10 on each poriferous coxa.

Spining of legs as in *latzeli*.

Anal legs of male long and slender, the fourth joint but slightly modified.

Length, up to 35 mm.

Localities—OKLAHOMA: Latimer County, 2 miles east of Gowen, 8 specimens taken April 26, 1936. ARKANSAS: Pulaski County, 3 miles northeast of North Little Rock, April 11, 1936, four specimens, and Jefferson County, ½ mile south of Locust Cottage, April 11, 1936, one specimen. All specimens collected by Leslie Hubricht.

BOTHROPOLYS MULTIDENTATUS (Newport). Locality—Missouri: St. Louis County, 2 miles west of Wellston, February 19, 1935, two taken under logs.

SCUTIGERIDA.

SCUTIGERA COLEOPTRATA (Linne). Localities—Missouri: St. Louis County, Forest Park, in bird house, March 14, 1936, one specimen; Fern Glen, March 1, 1936, one specimen; taken under rocks; St. Louis, April 5, 1934, several specimens taken in house on Lincoln Avenue; Musicks Ferry, May 15, 1934, several taken under rocks.

Notes on Bees (Hymen.: Andrenidae).

By J. Chester Bradley, Cornell University, Ithaca, New York.

Tetralonia.

The lectotypes of *Melissodes dilecta* (♂) and of *M. speciosa* (♀) of Cresson have both been examined. In neither are the hind tibial spurs hooked. They both come from Colorado.

Several specimens in the collection of the American Entomological Society from Illinois with hooked hind tibial spurs, ♂ and ♀, stand incorrectly determined, the males by Cresson as *dilecta* and one by Viereck as *speciosa,* the females by Cresson as *speciosa.* One ♂ from "Col" and one from "Tex" both are also cospecific with the Illinois specimens.

The type of *frater* Cr. (♂), which name Robertson in 1895 thought synonymous with *dilecta,* is structurally different from the type of the latter species, as well as from the one which Robertson misidentified as *dilecta* Cr. Robertson in 1905 indicated his error in this regard and stated that the hind tibial spurs of the type of *frater* are not hooked, but still overlooked the fact that such is also the case in both *dilecta* and *speciosa.*

Tetralonia hamata n. sp.

♂.—General appearance and coloration of the type of *dilecta* Cresson, but the vestiture of the dorsum of the thorax less dense, and the vestiture of the second (morphologically 3rd) tergite similar to that of the first but shorter, without the white fascia of *dilecta.* Hind tarsal spurs very strongly hooked. Last sternite without a basal lateral fossa but with a strong truncate peg-like process at the middle of each lateral margin, the two divergent but sub-erect. L. 14 mm.

♀.—General appearance and color of the type of *speciosa* Cresson, but the vestiture of the hind tibiae tends to be paler than that of the metatarsus, which is not the case in *speciosa.* Hind tibial spurs hooked, but less strongly so than in the males. The pygidial plate is more broadly rounded than in *speciosa.* L. 15 mm.

Holotype ♂, *Allotype* ♀, 6♂ *paratypes* and 4♀ *paratypes,* all from Illinois, but without closer indication of locality; one ♂ paratype from "Tex" and one ♂ paratype from "Col," bearing labels as paratypes of *dilecta.* All are in the collection of the American Entomological Society.

Under the names *speciosa* and *dilecta* what is doubtless this

species has been recorded from Carlinville and near Chicago, Illinois, as well as from Indiana.

I have seen the true *dilecta* from Colorado, Texas and South Dakota, but whether records from Kansas and New Mexico are *dilecta* or *hamata* is uncertain.

In comparison with *hamata*, it may be stated that the ♂ of *dilecta* has a lateral fossa on the basal half of the last sternite, abruptly terminated internally, and lacks the peg-like processes of the lateral margin.

Professor T. D. A. Cockerell (Trans. Amer. Ent. Soc. '06, 32:94) stated that *dilecta* may be easily distinguished from *frater* and *speciosa* by its hooked spurs; he informs me that he based this statement on a paratype loaned to him at the time and which must have been one of the two that I am now making paratypes of *hamata*. It is to be regretted that when Mr. Cresson later selected the lectotype of *dilecta* he did not select the Texas specimen, as then the species would stand as defined by Professor Cockerell, and as understood by Robertson. But since Cockerell, '06, cannot be construed as making a prior selection of a lectotype (he did not in fact know that two species were involved in the type series, nor even mention in print that he had a type), Mr. Cresson was at liberty to make what selection he saw fit and his published designation must be honored, if we are to attach any weight at all to the idea of lectotype.

PSEUDOPANURGUS (P.) ILLINOIENSIS (Cresson). *P. compositarum* Robertson seems to be a synonym. The type (♂) of *illinoiensis* runs to *compositarum* in Robertson's key to Illinois species. I have also compared with it a ♀ "metatype" of *compositarum* in the collection of the American Entomological Society labelled by Viereck.

CALLIOPSIS ABDOMINALIS Cresson. *C. tricolor* Ckll. is at best a subspecies. There are two females in the collection of the American Entomological Society both from New Jersey. The female differs from other eastern species in having both metanotum and propodeum uniformly densely granularly punctate, the metanotum without hair. The male differs from our other species in having the 5th and 6th sternites simple, instead of the fifth with a median process which projects posteriorly between two processes of the sixth, these sometimes (*coloradensis*) recurved.

The Butterflies of Roanoke and Montgomery Counties, Virginia (Lepid.: Rhopalocera).

By CARROLL E. WOOD, JR., and CARL W. GOTTSCHALK.

(Continued from page 164.)

COLIAS PHILODICE PHILODICE Godart. S, iv 5, '39; v 1, '38; xi, '37. MF, vi 15, '38. B, iv 19, '24; ix 2, '98; ix 9, '98 (*anthyale*).

C. PHILODICE EURYTHEME Boisduval. S, iii 25, '38 (*ariadne* ♀, very dark); iii 26, '38 (*ariadne* ♂); iv 28, '38 (white ♀); xii 2, 23, '40. Roanoke Co., ix 17, '37. M, common.

EUREMA NICIPPE (Cramer). S, iv 13, '38; vii 16, '39; xi 12, '38; xi 30, '40; xi '37 (the first and last three reddish beneath). FL, vii 1, '37. CH, x 31, '37. AB, vi 5, '37. Mt. Lake, Giles Co., vii 8, '39.

E. JUCUNDA (Boisduval and LeConte). S, '35; also without date. FL, vii 30, '39; viii 4, '31, '38; ix 6, '38. AB, ix 8, '39. Mill Mt., Roanoke Co., viii 28, '38. Baptist Orphanage, Roanoke Co., ix 1, '37.

E. LISA (Boisduval and LeConte). S, viii 6, ix 30, x 9, '38. FL, vii 10, viii 24, '38. KH, x 31, '37. AB, v 29, '36.

Subfamily Papilioninae.

PAPILIO PHILENOR Linné. S, ix 16, '39; ix 17, '37. KH, iv 16, 24, '38. FL, vii 21, viii 3, '36. B, viii '94.

P. POLYXENES ASTERIAS Cramer. S, viii 11, '38. KH, iv 11, '39; ix 16, '38; iv 19, '36. FL, viii 6, '37; ix 5, '38.

P. CRESPHONTES Cramer. S, viii '38. M, v 26, '98.

P. GLAUCUS Linné. S, v 1, '38 (winter form). FL, vii 13, '36; vii 25, '37; viii 8, '38; vii 19, '39. M, iv 10, '99 (black); v 26, '98; viii 19, '07.

P. TROILUS Linné. S, v 7, '38; vi 3, 6, '39; viii 23, '40. SC, iv 15, '38; viii 22, '39. FL, vii 25, '38.

P. MARCELLUS Cramer. KH, iv 15, '38 (*walshi*); v 9, '38 (*telamonides*); vi 5, '38. FL, vi 5, viii 21, ix 4, '38. MF, iv 13, '38. B, iv 7, '03 (bi-formed ♀ *walshi* & *telamonides*). M, iii 2, '03. Camp Powhatan, Rockbridge County, iv 18, '37 (*walshi*); v 1, '38.

Family Hesperiidae; Subfamily Pyrginae.

Proteides clarus (Cramer). S, iv 28, '38. KH, vi 10, '38. FL, viii 30, '38. M, vi 2, '99; vii 28, '98.

Achalarus lyciades (Geyer). FLM, vi 25, '36; vi 9, '39. FL, viii 27, '37. MF, v 25, '38. M, vi '96.

Rhabdoides cellus (Boisduval and LeConte). SC, v 3, '38; vi 9, '39. Ravine east of Blacksburg near Palmer Hill, now called Trillium Vale, v 26, vi 6, 26, '00.

Thorybes bathyllus (J. E. Smith). KH, v 7, 23, 29, 31, vi 5, '38. FL, vii 21, '36; viii 16, '38. M, v 10, '98; viii '99.

T. pylades (Scudder). S, v 7, '38. FLM, vi 23, '38. KH, vi 9, '39. AB, vi 14, '38. M, vi 2, '99; vi 9, '39.

Pyrgus centaureae wyandot (W. H. Edwards). KH, iii 28, iv 11, '38. OF, iv 8, '39. M, iv 16, 28, '98.

P. communis (Grote). S, iv 24, v 9, '38; iv 18, '39. RC, xi 7, '40. FL, viii 6, '36; viii 18, '37. M, ix 5, '98.

Pholisora catullus (Fabricius). S, viii 18, '38. FL, vi 30, '38; vii 26, '38; vii 31, '39; viii 17, '38. AB, v 31, '37. M, no date.

Erynnis icelus (Scudder and Burgess). KH, iv 11, 12, 26, '38; iv 9, '39; v 3, 18, '38; v 7, '40. FLM, vi '38. M, vi 20, '98.

E. brizo (Boisduval and LeConte). FLM, iv 5, '39; v 11, '37. OF, iv 2, '39. SC, iii 26, iv 3, '38. OF, iv 2, '39; iv 5, '38. AB, iv 23, '38. M, v 14, 16, '98.

E. persius (Scudder). FLM, iv 23, '38; also '40 (kindly determined by W. D. Field).

E. lucilius (Scudder & Burgess). Fort Lewis Mt., April 23, 1938; Salem, May 9, 1937 (determined by W. D. Field).

E. baptisiae Forbes. S, v. FLM, iv 25, '40; viii 20, '37. AB, v 13, '38. M, viii 1, '99. Smyth Co., viii, '40.

E. martialis (Scudder). KH, iv 11, 28, '38; v 6, '38. FLM, vi 25, '36. MC, viii 7, '40. B, v.

E. juvenalis (Fabricius). FL, viii 6, '36; viii 18, '38. OF, iv 19, 22, '38; iv 2, 8, '39; iv 25, '40; v 5, '40. M, iv 17, v 9, '98.

E. horatius (Scudder and Burgess). KH, vi 7, '40; vi 15, '38.

E. ZARUCCO (Lucas). PH, viii 8, '38.

Subfamily Hesperiinae.

ANCYLOXYPHA NUMITOR (Fabricius). S, v 17, '38; vi 30, '37; vii 18, '38. FL, viii 27, '38. MF, vi 1, '40. M, vi 2, '99.

HESPERIA METEA (Scudder). OF, iv 5, 12, 15, 23, '38; iv 25, '40; v i, '38. AB, v 2, '37.

H. LEONARDUS Harris. PH, viii 15, '00; viii 22, '98.

H. SASSACUS Harris. KH, v 6, '38. M, vi 2, '99; vi 6, '00.

HYLEPHILA PHYLAEUS (Drury). S, viii 22, xi 2, '38. FL, vii 26, '38; viii 11, 25, '38; viii 16, '37; ix 5, '38. M, no date.

ATALOPEDES CAMPESTRIS (Boisduval). S, v 5, 10, ix 12, '38; xi 7, '40. FL, v 22, 27, 31, '37. M, v 16, '00; ix 4, '98.

POLITES VERNA (W. H. Edwards). M, vi 20, '99.

P. MYSTIC (Scudder). AB, vi 1, '37. Preston graveyard, Blacksburg, vi 2, 3, '99.

P. MANATAAQUA (Harris). S, v 21, 27, '38; vi 6, '39; viii '38. FLM, v 31, '38; vi 5, 25, '38. FL, viii 30, '39; viii 9, '38. M, vi 2, '99; viii 8, '98.

P. THEMISTOCLES (Latreille). S, v 23, 27, 29, '38. KH, v 28, '38. FL, v 16, vi 7, '38; vii 28, '39; viii 9, '38; viii 2, 9, '39. AB, vi 5, '37. SC, v 7, '38. M, v 16, '00; vi 2, '99.

P. PECKIUS (Kirby). S, v 27, '38. KH, v 21, '38. FL, vii 25, '39; viii 12, '38; viii 17, '39; vii 28, '40. MF, vi 13, '38. M, vi, vii 20, '99.

P. BRETTUS (Boisduval and Leconte). M, no date (2 males).

POANES HOBOMOK (Harris). KH, iv 3, '39; iv 28, '38; v 6, 9, 10, '38. FLM, v 7, vi 5, '38. M, v 25, vi 2, 3, '99.

P. ZABULON (Boisduval and LeConte). S, iv 25, '38. KH, iv 27, v 3, 12, '38. FL, iv 28, vii 28, '38; vii 31, viii 5, 8, '37; viii 25, ix 1, '39. AB, v 20, '37. M, v 12, '00; vi 2, '99.

ATRYTONE AROGOS (Boisduval and LeConte). B, no date.

A. LOGAN (W. H. Edwards). S, vii 22, '26. FL, vii 2, '39. M, viii 8, '98.

A. RURICOLA (Boisduval). S, v 23, '38. FL, vii 4, 9, 17, '38; viii 28, '40. MF, v 21, vi 3, '38. M, vi 29, viii 3, '00.

WALLENGRENIA OTHO EGEREMET (Scudder). FL, vii 27, viii 23, '37. M, vi 20, '99; viii 8, '98.

ATRYTONOPSIS HIANNA (Scudder). KH, v 6, 13, 17, vi 6,

'38; vi 3, '40. FLM, v 7, '38.

LEREMA ACCIUS (J. E. Smith). S, ix 13, '37. KH, v 12, '38. FL, vii 25, viii 31, '37. M, vii 25, '06; x 2, '98.

AMBLYSCIRTES VIALIS (W. H. Edwards). S, iv 23, '39. KH, iv 11, 13, 19, v 12, vii 27, '38. FLM, iv 23, '38. M, v 12, vii 6, '00.

A. HEGON (Scudder). S, iv 24, '38; v 2, '37. AB, iv 23, '38; Dixie Caverns, v 5, '40. M, vi 2, '99.
'38; viii 20, '37. FLM, vi 5, '38. M, vi 2, '99.

LERODEA L'HERMINIER (Latreille). MF, v 12, 17, 21, 31, '38; viii 20, '37. FLM, vi 5, '38. M, vi 2, '99.

L. EUFALA (W. H. Edwards). FL, vii 23, '39; ix 6, '37.

PANOQUINA OCOLA (W. H. Edwards). FL, viii 5, 12, 18, '38; viii 21, '36.

OTHER POSSIBLE OCCURRENCES.

While we feel that the above list represents most of the species occurring in the area under consideration, it is likely that several additional species may occur as casuals, as occasional temporary residents, or as local residents which have escaped observation. In addition to those species listed below (most of which have been taken in adjacent counties), several other forms may possibly turn up in the area.

ENODIA PORTLANDIA ANTHEDON: Known from Giles County, adjoining Montgomery County on the north, and from Bedford County[5], to the east of Roanoke County.

ARGYNNIS MYRINA: Has been taken at Kelly Flats, Giles County, by Dr. Clark and at Little Meadows in the same county by the authors.

PHYCIODES BATESI: Taken by Dr. A. H. Clark in southern Scott County, by Lloyd G. Carr and the junior author at Mt. Lake, Giles County (July 1, 1940 and July 17, 1941, respectively), and by the senior author on Apple Orchard Mountain[6] in Bedford County. These records represent the known occurrence of this butterfly in Virginia.

[5] Clark, Proc. Biol. Soc. Wash., 47: 177-180.
[6] Clark, Proc. Biol. Soc. Wash., 51: 177-182.

ERORA LAETA: A single specimen was taken by Dr. L. J. Milne, Randolph-Macon College, at Mt. Lake, Giles County, on June 23, 1938, as recorded by Dr. Clark[7]. This southwestern species might just as well turn up in our area as anywhere else.

STRYMON EDWARDSI: An inhabitant of oak woods which might well occur in either county.

ATRYTONE CONSPICUA: An extremely local species which *may* inhabit grassy bogs in the area. Its discovery by Lloyd Carr in July, 1940, at Little Meadows, Giles County, comprises a new southern record,[8] the species being previously unknown from Virginia.

We wish to express here our appreciation to the friends who made this paper possible. Dr. Austin H. Clark, of the U. S. National Museum, whose work on Virginia butterflies is well known, has given us much encouragement and information and has always been our constant counsellor. He has also been so very kind as to help get our records in order and has offered valuable material and suggestions as to the content of this paper.

Our kind friend, the late Dr. Ellison A. Smyth, Jr., always gave us free access to his large collections, records and library and always took a real interest in our work. As pointed out previously, the Montgomery County records are almost exclusively the result of his collecting over a period of years. His passing was keenly felt.

Our thanks also go to Walter Van Gelder and Lloyd G. Carr, who have provided several interesting records and to Mr. W. D. Field, of the U. S. National Museum, who has identified a number of specimens of *Erynnis* for us.

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From time to time scattered notes have appeared on a few species from Montgomery and Roanoke Counties. These notes are included in the following papers.

CLARK, AUSTIN H., Butterflies of Virginia. Explorations and Field-Work of the Smithsonian Institution in 1939, 1940, pp. 63-66.

[7] Clark, Proc. Biol. Soc. Wash., 52: 177-184.

[8] Clark, Expl. & Field Work Smithsonian Inst., 1940, p. 60.

CLARK, AUSTIN H., and LEILA F. CLARK, Butterflies from Virginia and the District of Columbia. Proceedings of the Biological Society of Washington, vol. 51, pp. 1-6, February 18, 1938.

ID., Notes on Virginia Butterflies, Proceedings of the Biological Society of Washington, vol. 51, pp. 177-182, November 3, 1938.

ID., Butterflies from Virginia. Proceedings of the Biological Society of Washington, vol. 52, pp. 177-184, December 15, 1939.

CLARK, AUSTIN H., and CARROLL M. WILLIAMS, Records of Argynnis diana and of some other butterflies from Virginia. Journal of the Washington Academy of Sciences, vol. 27, No. 5, May 15, 1937, pp. 209-213.

SMYTH, ELLISON A., JR., Some entomological notes from Montgomery County, Virginia. Entomological News, vol. 6, No. 8, October, 1895, pp. 243-245.

ID., Calephelis borealis. Psyche, vol. 7, No. 243, July, 1896, p. 403.

ID., Anthocharis genutia. Entomological News, vol. 11, No. 5, May, 1900, pp. 465-468.

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ID., Color phases in Argynnis diana. Entomological News, vol. 27, No. 3, March, 1916, pp. 136-137.

WOOD, WILLIAM C., Argynnis diana. Entomological News, vol. 27, No. 1, January, 1916, p. 35.

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CLARK, AUSTIN H., Surveying the butterflies of Virginia.

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ID., The butterflies of Virginia. Explorations and field-work of the Smithsonian Institution in 1938, 1939, pp. 65-68.

ID., The Butterflies of the District of Columbia and Vicinity. Smithsonian Institution Bulletin 157, 1932.

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SMYTH, ELLISON A., IV, The Raven, vol. 9, No. 7, pp. 56-58, July, 1938.

The Describers of Insect Species.

I am very desirous of obtaining from all entomologists who have described one or more *new species* of insects a statement of the *total number* described by each one to this date. Where more than a single order of insects is involved, an indication of the total for each order would be appreciated. If there are known synonyms among such species, the number of valid species or subspecies should be given. It is hoped that the response to this appeal will be such that a summary of the subject may be presented in the not distant future. A most favorable response from entomologists has been received and further cooperation will be greatly appreciated. In the cases of deceased entomologists, where figures of described species have already been published, many such data are available to me, but further references, especially in obscure journals, would be much appreciated. I wish at this time to express my very deep thanks to the many entomologists who have so kindly cooperated in this attempt to determine more accurately the total number of described insect species. Address all communications to

DR. CHARLES P. ALEXANDER, Fernald Hall, Massachusetts State College, Amherst, Massachusetts, U.S.A.

A Brachypterous Reduvius from Lower California (Heteroptera: Reduviidae).

By ROBERT L. USINGER, University of California, Davis, California.

The genus *Reduvius* Fabr. (=*Opsicoetus* Klug) is distributed throughout much of the old world with the greatest concentration of species in the Palearctic, Ethiopian, and Oriental Realms. Only the nearly cosmopolitan *Reduvius personatus* Linn. had been reported from the Western Hemisphere until Van Duzee (1906) described *senilis* from the Baboquivari Mountains of Arizona. I later (1933) recorded *senilis* from California and can now report an additional specimen from Patagonia, Arizona, July 1936, E. S. Ross collector.

Three brachypterous specimens of a second native American species were discovered in the collection of the California Academy of Sciences. Although collected by Van Duzee and Chamberlin on the Academy expedition to the Gulf of California, these specimens were not mentioned in the report on the Hemiptera of that expedition (Van Duzee, 1923).

Reduvius sonoraensis new species.

Relatively small, light brown to testaceous, with reduced pronotum, short hemelytral pads exposing the entire dorsal surface of the abdomen, the body densely clothed with long erect or curved hairs.

♂. Head nearly twice as long as broad including eyes, 38::20; strongly produced and moderately deflected in front of eyes; antennae inserted dorso-laterally immediately in front of eyes; an elongate, bilobed elevation between bases of antennae; eyes half as wide as interocular space and about half again as long as wide seen from above; eyes much wider laterally but not extending far beneath the head, the ventral interocular space much wider than an eye. Ocelli small but distinct. Antennae relatively short, the first segment as long as width of head across eyes, second segment slightly more than twice as long as first, 42::20, last two segments very slender and curved. Rostrum stout and curved, the first segment about three-fourths as long as second.

Pronotum scarcely broader across humeri than long, 37::35, the anterior margins strongly depressed, collar-like, with feebly produced, rounded antero-lateral angles; anterior lobe strongly convex, with a median longitudinal impression; posterior lobe reduced, about two-thirds as long as anterior lobe, one-third broader, the disk less strongly convex, feebly transversely wrinkled anteriorly between longitudinal connecting carinae; postero-lateral angles broadly rounded. Scutellum about as

broad as long, subtriangular, its apex produced into a cylindrical spine, the disk depressed at middle. Hemelytra reduced to short strap-like or subtriangular pads which just attain hind margin of metathorax.

Abdomen entirely exposed above, the first segment elevated with its posterior margin carinate and with lateral spiracles distinct. Second segment longitudinally carinate on either side of middle. Third, fourth, and fifth segments each with an obscure scent gland opening at middle of posterior margin. Under surface of abdomen distinctly keeled or carinate, the genital capsule convex, with briefly truncate apex. Claspers briefly exposed.

Legs moderately short and stout, the front and middle tibiae feebly bent inward at apices and bearing small but distinct spongy fossae.

Color pale fulvous becoming brown laterally and ventrally on thorax and abdomen. Eyes dark brown. Ocelli red. Posterior lobe of pronotum, hemelytral pads, connexivum, and legs in part pale testaceous.

♀. Similar to the male but with the second antennal segment relatively shorter, scarcely more than half again as long as first, 33::20, and with the brown color more extensive both above and beneath. Female genital plates broadly exposed and subtriangular above, very briefly exposed beneath.

Size: male, length 9 mm., female, 10 mm.

Holotype, male, and *allotype,* female, Nos. 5276 and 5277, Calif. Acad. Sci., Ent., collected by J. C. Chamberlin on Isla Raza, Gulf of California, April 21, 1921. A single female paratype bears the data: Angeles Bay, Gulf of California, May 5, 1921, E. P. Van Duzee collector.

Sonoraensis is related to *Reduvius senilis* Van Duzee. However, *senilis* is somewhat larger, has a shorter and sparser vestiture, and has the first antennal segment distinctly longer than width of eyes, 29::25, the second segment less than twice as long as the first in the male, the first and second rostral segments subequal in length, and the eyes much larger, the ventral interocular space being much less than the width of an eye. Only macropterous specimens of *senilis* are known so a comparison of thoracic and hemelytral characters has not been possible.

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The American Commission on Scientific Nomenclature in Entomology.

The disturbed condition of the world during the last few years has interfered with the activities of the International Commission on Zoological Nomenclature and there is no prospect that this Commission will again function successfully for several years to come. Entomologists in the United States have felt that this situation should not be allowed entirely to stifle progress in the development of nomenclature and the clarification of nomenclatorial problems. At the meetings of the Entomological Society of America and the American Association of Economic Entomologists in San Francisco, in December, 1941, a plan was adopted which called for the establishment of an American Commission on Scientific Nomenclature in Entomology.

In accord with the terms of this plan, Mr. C. F. W. Muesebeck and Professor G. F. Ferris were appointed to organize the Commission. That organization has now been completed and the Commission is ready to function. It includes Prof. J. C. Bradley, of Cornell University; Mr. W. J. Brown and Mr. G. Stuart Walley, of the Division of Entomology of the Department of Agriculture of Canada; Prof. G. F. Ferris, of Stanford University; Prof. T. H. Hubbell, of the University of Florida; Prof. H. B. Hungerford, of the University of Kansas; Dr. E. G. Linsley, of the University of California; Prof. Clarence E. Mickel, of the University of Minnesota; Mr. C. F. W. Muesebeck and Mr. P. W. Oman, of the United States Bureau of Entomology and Plant Quarantine; Dr. A. G. Richards, Jr., of the University of Pennsylvania; Dr. Herbert H. Ross, of the State Natural History Survey of Illinois; Prof. C. W. Sabrosky, of the State Agricultural College of Michigan; Dr. R. L. Usinger, of the College of Agriculture of California. Prof. G. F. Ferris has been elected as Chairman.

The Commission will receive, consider and advise upon such nomenclatorial problems as are presented to it. All acts of the Commission will be in harmony with the International Rules of Zoological Nomenclature, although recommendations for the clarification, extension and improvement of these rules may be made. The Commission will report to the two parent societies at their next annual meeting. Communications concerning matters within the province of the Commission may be addressed to any of its members.

Current Entomological Literature

COMPILED BY THE EDITORIAL STAFF.

Under the above head it is intended to note papers received at the Academy of Natural Sciences of Philadelphia pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species will be recorded.

This list gives references of the current or preceding year unless otherwise noted. All continued papers, with few exceptions, are recorded only at their first installment.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

Note. References to papers containing new forms or names not so stated in titles are followed by (*); if containing keys are followed by (k); papers pertaining exclusively to neotropical species, and not so indicated in the title, have the symbol (S) at the end of the title of the paper.

The figures within brackets [ ] refer to the journal in which the paper appeared, as numbered in the list of Periodicals and Serials published in our January and June issues. This list may be secured from the publisher of **Entomological News** for 10c. The number of, or annual **volume**, and in some cases the part, heft, &c., the latter within ( ) follows; then the pagination follows the colon :

Papers published in the Entomological News are not listed.

NEW ADDITIONS TO LIST OF PUBLICATIONS:

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The biology and culture of Neoaplectana chresima, a new nematode parasitic in insects. [J. Parasit.] 28: 123-126. **Hanna, A. D.**—See under Diptera. **Hudson, G. V.**—Economic versus "Amateur" entomologists and a suggestion. [21] 54: 42-43. **Jones, Thomas H.**—Obituary by G. B. Merrill. [39] 25: 13-14. **Kartman, L.**—A note on vitamins in relation to ectoparasite resistance. [J. Parasit.] 28: 170-171. **Little & Martin.**—Cotton insects of the United States. Minnesota. 1941. 130 pp. **Moojen, Candido de Carvalho et de Souza Lopes**—Observacoes sobre o conteudo gastrico das aves brasileiras. [111] 36: 405-444. **Moreau, R. E.**—The nesting of African birds in association with other living animals. [The Ibis] Ser. 14, vol. 6: 240-263. **Mumford, E. P.**—The study of faunal distribution with particular reference to oceanic islands. [Amer. Philo. Soc. Yr. Book] 1941: 136-138. **Pearse, Humm & Wharton.**—Ecology of sand beaches at Beaufort, N. C. [Ecological Monogr.] 12: 135-190, ill. **Travassos Filho, L.**—Notas de uma expedição realizado de fevereiro a março de 1940, às localidades de Ilha Sêca, no estado de São Paulo, e Salobra, no estado de Mato Grosso. [125] 1: 57-64. 1941. **Warren, B. C. S.**—A note on the desirability of precision in the use of the international rules. [9] 75: 90-91. **Watson, J. R.**—Effects of cold weather upon insects in their wild habitata. [39] 25: 14-15. **Weatherby, C. A.**—Subspecies. [Rhodora] 44: 157-167. **Weyrauch, W.**—Nidos de insectos peruanos en el Mus. Hist. Nat. [Bol. Mus. Hist. Nat. Javier Prado] 6: 52-66, ill. **Wilkes, A.**—The influence of selection on the preferendum of a chalcid (Microplectron fuscipennis) and its significance in the biological control of an insect pest. [Proc. R. Soc. London] (B) 130: 400-514. **Wilmott, A. J.**—The nature of the genotype. [9] 75: 113-116. **Zimmerman, E. C.**—Distribution and origin of some eastern oceanic insects. [90] 76: 280-307.

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the heads of insects. [117] 7: 25-62, ill. **Hafez, M.**—A study of the biology of the Egyptian common housefly: Musca vicina Macq. [124) 25: 163-189, ill. (See also under Diptera.) **Harnly, M. H.**—Wing form and gene function in nine genotypes of Drosophila melanogaster. [92] 82: 215-232. **Holdsworth, R. P.**—The wing development of Pteronarcys proteus Newman. [J. Morph.] 70: 431-461, ill. **Hughes-Schrader, S.**—The chromosomes of Nautococcus schraderae Vays, and the meiotic division figure of male llaveiine coccids. [J. Morph.] 70: 261-299. **Johnson, C. G.**—Insect survival in relation to the rate of water loss. [Biol. Rev., Cambridge Physiol. Soc.] 17: 151-177. **Mansour, K.**—See under Coleoptera. **Miller, E. R.**—The skeletal muscles of the soldier beetle (Chauliognathus marginatus (Abstract). [Proc. Louisiana Ac. Sci.] 6: 74-75. **Mohamed Taher El Sayed.**—See under Coleoptera. **Patch, L. H.**—Height of corn as a factor in egg laying by the European corn borer in the one-generation area. [47] 64: 503-515. **Philip, U.**—Meiosis in Drosophila. [31] 149: 527-528. **Pophan, E. J.**—The influence of light in the migration of Corixidae. [9] 75: 77-80. **Priesner, H.**—A brief note on the relation between the physiological condition of plants and insect attack. [124] 22: 279-283. 1939. **Schremmer, F.**—Sinesphysiologie und Blumenbesuch des Falters von Plusia gamma. [89, Syst.] 74: 375-434, ill. **Soliman, H. S.**—See under Hymenoptera. **Watson, J. R.**—Sarcophaga bullata as a cause of intestinal myiasis. [39] 25: 5-6. **Yeager & Munson**—Changes induced in the blood cells of the southern armyworm by the administration of poisons. [47] 64: 307-332, ill.

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